भारतीय मानक
Indian Standard

IS 9131 : 2021
[*Superseding IS 3847 : 1992*]

रिम ताले और लैचेस (मैकेनिकली संचालित) — विशिष्टि

(पहला पुनरीक्षण)

Rim Locks and Latches (Mechanically Operated) — Specification

(First Revision)

ICS 91.190

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Utensils, Cutlery Domestic Hardware Sectional Committee, MED 33

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Utensils, Cutlery Domestic Hardware Sectional Committee had been approved by the Mechanical Engineering Divisional Council.

This Indian Standard has been formulated by amalgamating IS 9131 : 1979 'Specification for rim locks' and IS 3847 : 1992 'Mortice night latches — Specification (*first revision*)'. After publication of this standard, IS 3847 : 1992 'Mortice Night Latches-specification' shall be withdrawn.

In this revision, the following major changes have been made:

1) Scope has been modified;
2) Terminology has been added;
3) Grade of the material has been updated; and
4) Corrosion resistance and temperature test have been added.

Rim locks are being commonly fixed to single- and double-leaf doors in buildings. They consist of a locking bolt as well as a latch bolt. The locking bolt is shot and withdrawn by operating a key from either side. Night latches are particularly fitted to doors of rooms where it is intended to have dual control over access to room from both inside and outside to authorized persons.

This standard has been prepared to give guidance to manufacturers and users in getting a product of good performance.

For handing of doors, reference may be made to IS 4043 : 1969 'Recommendations for symbolic designation of direction of closing and faces of doors, windows and shutters'.

The relevant SI units and corresponding conversion factors are given below for guidance:

Pressure 1Pa (Pascal) $= 1\ \text{N/m}^2$

1 kgf/mm^2 = 9.806 65 MPa

The composition of the Committee responsible for the formulation of this standard is given in Annex B.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

RIM LOCKS AND LATCHES (MECHANICALLY OPERATED) — SPECIFICATION

(First Revision)

1 SCOPE

1.1 This standard specifies requirements and test methods for durability, strength, security and function of mechanically operated locks and latches and their locking plates for use in doors and entrance doors in buildings.

1.2 The following locking devices and associated products are not covered by this standard:

a) Electro mechanically operated locks, striking plates, multi point locks and their locking plates.

2 REFERENCES

The standards listed below contain provisions which, through reference in this text constitute provisions of this standard. At the time of publication, the editions were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	*Title*
210 : 2009	Grey iron castings — Specification (*fifth revision*)
292 : 1983	Specification for leaded brass ingots and castings (*second revision*)
318 : 1981	Specification for leaded tin bronze ingots and castings (*second revision*)
319 : 2007	Free cutting brass bars, rods and section — Specification (*fifth revision*)
410 : 1977	Specification for cold rolled brass sheet, strip and foil (*third revision*)
617 : 1994	Cast aluminium and aluminium alloy — Ingots and castings for general engineering purposes — Specification (*third revision*)
737 : 2008	Wrought aluminium and aluminium alloy sheet and strip for general engineering purposes — Specification (*fourth revision*)
742 : 1981	Specification for zinc base alloy die castings (*second revision*)
1079 : 2017	Hot rolled carbon steel sheet, plate and strip — Specification (*seventh revision*)
1570 (Part 5) : 1985	Schedules for wrought steels: Part 5 Stainless and heat-resisting steels (*second revision*)
1573 : 1986	Specification for electroplated coatings of zinc on iron and steel (*second revision*)
4043 : 1969	Recommendations for symbolic designation of direction of closing and faces of doors, windows and shutters
4454 (Part 1) : 2001	Steel wires for mechanical springs — Specification: Part 1 Cold drawn unalloyed steel wire (*third revision*)
6911 : 2017	Stainless steel plate, sheet and strip — Specification (*second revision*)
7608 : 1987	Specification for phosphor bronze wires for general engineering purposes (*first revision*)
14329 : 1995	Malleable iron castings — Specification

3 TERMS, DEFINITIONS, SYMBOLS AND UNITS

For the purpose of this standard, the following terms and definitions apply.

3.1 Case — Part of a lock or latch in which the lock or latch mechanism is housed.

3.2 Cylinder — Device, usually separate from but engaging with its associated lock or latch that contains the parts operated by the key.

3.3 Dead Bolt — Bolt that is operated in both directions by a key, handle and/or thumb turn.

3.4 Follower — Part of lock that operates the bolt when turned by a spindle.

3.5 Detainers — Part of a movable member which is moved by the key in to a predetermined position in order for the bolt to be able to move in to an opening/closing position.

3.6 Differ — Variation between lock mechanisms of similar design, achieved by the detaining elements, which allows each lock to be operated only by its own key.

3.7 Effective differ — Difference between lock or key recognition systems of similar design achieved only by the detainers which allows each lock or key recognition system to be operated only by its own key. The number of effective differs is equal to the number of Theoretical differs after deduction of the differs suppressed by the manufacturer due to technical constraints.

3.8 Key — Device that is removable and portable and is used to operate the lock or latch.

3.9 Latch Bolt — Moving part of the latch that engages the locking plate automatically due to spring force.

3.10 Locking Plate or Striker Box — Component, fixed to a frame to engage a bolt or bolts.

3.11 Lock Mechanism — Constituent parts of a lock that operates the dead bolt and where required, provide the differs

3.12 Symbols, Units and Abbreviated Terms — For the purposes of this standard, the following symbols shown in Table 1 and Fig. 1 shall apply.

Table 1 Symbols

(*Clause* 3.12)

Sl No.	Symbol Test Parameter	Definition	Unit
(1)	(2)	(3)	(4)
i)	F_1	Lateral force on latch bolt (strength test)	kN
ii)	F_2	Return force of latch bolt	N
iii)	F_3	Lateral force on latch bolt and locking plate (durability test)	N
iv)	F_4	Lateral force on dead bolt and locking plate	kN
v)	F_5	End load on deadbolt or locking plate	kN
vi)	F_6	Door closing force (operating requirement)	N
vii)	F_7	Door closing force (durability test)	N
viii)	L_1	Dead bolt projection	mm
ix)	L_2	Resulting projection	mm
x)	M_1	Torque to with draw the latch bolt with key	Nm
xi)	M_2	Torque to operate the dead bolt with key (*see* Fig. 2)	Nm
xii)	M_3	Torque resistance of rim lock with lockable handle/knob	Nm
xiii)	T	Temperature	Deg.

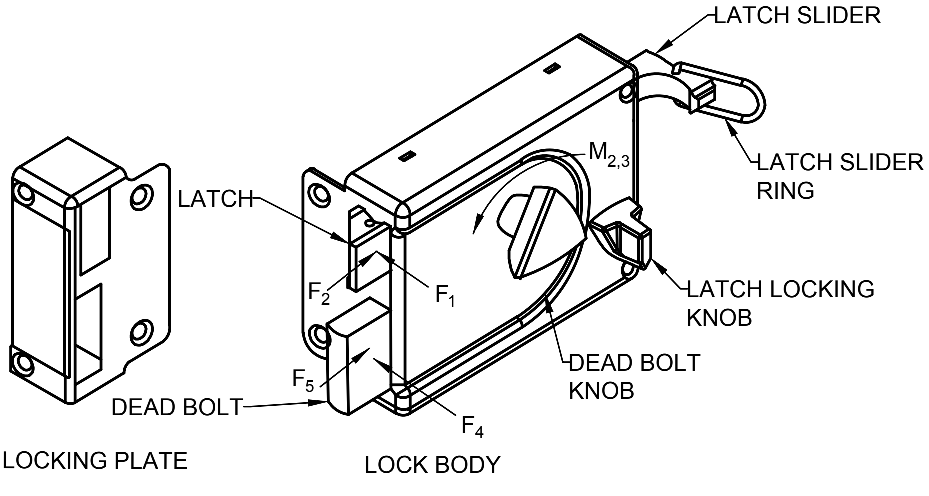


Fig. 1 Typical Sketch for RIM Lock and Latch

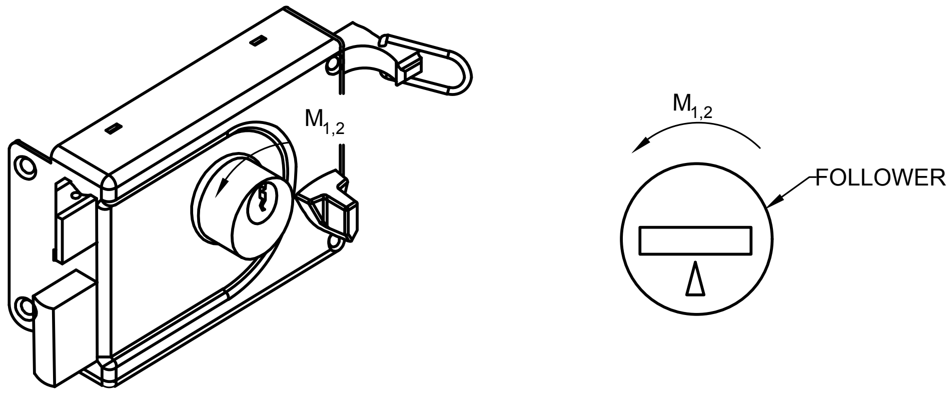


Fig. 2 Application of Torque (M2) to Operate Dead Bolt

4 HANDING OF RIM LOCKS AND LATCHES

Rim locks and latches are normally made universal that is, suitable for right hand and left hand doors. In some cases, like lever locks, separate models are made for left hand and right hand doors.

5 TYPES

The rim locks and latches shall be of the following two types:

a) Type 1 left hand or right hand for inside opening doors;
b) Type 2 reversible (Universal), Suitable for left and right hand doors inside opening doors;
c) Type 3 left hand or right hand for outside opening doors; and
d) Type 4 reversible (Universal), Suitable for left and right hand doors outside opening doors.

6 SIZES

6.1 The nominal sizes of the rim lock and latch shall be 100 mm (length) × 75 mm (width minimum), 125 mm (length) × 82 mm (width), 149 mm (length) × 104 mm (width) and may vary according to the technology used, features provided and design of the body (*see* Fig. 3). The specified sizes may vary according to the technology used, features provided and design of the body.

6.1.1 The locks and latches of sizes other than those specified in **6.1** may be supplied by mutual agreement between the purchaser and the supplier.

7 SHAPE AND DESIGN

The shape and design of the lock, latches and its components as indicated in Fig. 1 are illustrative only. The manufacturer may make rim locks and latches of any shape to suit his design. However, the lock and latches shall be capable of being opened with the key from both side or one side key and other side knob.

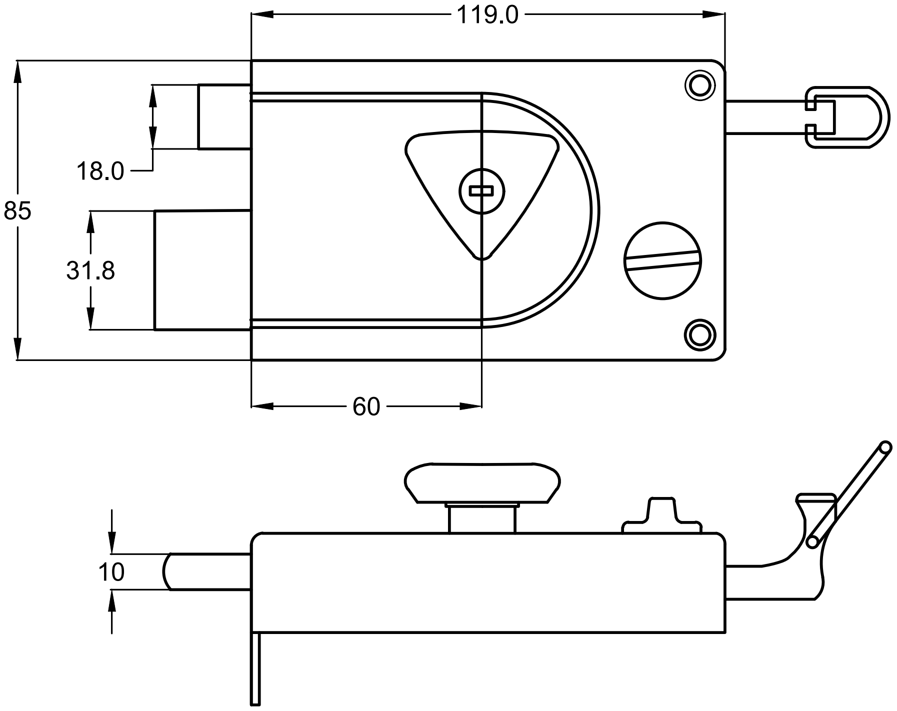
8 MATERIALS

Materials used depend on the design of lock or latch and application; however used materials may comply with a Table 2.

Table 2 Requirement of Materials for Rim Locks and Latches

(*Clause* 8)

Sl No.	Material	Suitable Grades in Indian Standards
(1)	(2)	(3)
i)	Mild steel	Any Suitable Grade as per IS 1079
ii)	Cast iron	FG 300 of IS 210 : 2009
iii)	Malleable iron	BM 300, BM 320, BM 350 of IS 14329
iv)	Cast brass	Any suitable Grade of IS 292
v)	Brass sheet	Any suitable Grade of IS 410
vi)	Extruded brass	Any suitable Grade of IS 319
vii)	Aluminium alloy pressure die casting	Any suitable Grade of IS 617
viii)	Aluminium alloy sheet	Any suitable Grade of IS 737
ix)	Leaded tin bronze	LTB 1, LTB 2 and LTB 3 of IS 318
x)	Zinc base alloy die casting	Any suitable Grade of IS 742
xi)	Phosphor bronze wire	Any suitable Grade of IS 7608
xii)	Spring steel wire	Any suitable Grade of IS 4454 (Part 1), can be round or strip compared as per IS 4454 (Part 4).
xiii)	Stainless steel	Any suitable Grade of IS 6911
xiv)	Zinc plating on steel	Any suitable Grade of IS 1573



All dimensions in millimeters

FIG. 3 TYPICAL DIMENSIONS OF RIM LOCK AND LATCH

9 WORKMANSHIP AND FINISH

9.1 Each lock and latch shall be free from defects likely to prevent correct fixing or to affect adversely the reliability in use.

9.2 Rim Locks and latches shall have bright or satin finish.

9.3 The finish of rim locks or its component may differ to **9.2** as per mutual agreement between the purchaser and supplier but locks and its component withstand corrosion requirement as per this standard.

10 REQUIREMENTS AND TEST METHODS

10.1 Return Force of Latch Bolt

The return force of the latch bolt shall not be less than F_2 = 2.5 N (*see* Fig. 1).

The lock or latch shall be held in a vice or similar fixture. Using a suitable force gauge operating in the same plane of movement as the latch bolt, the latch shall be depressed fully with the force gauge, then allowed to extend until the leading edge of the bolt head is 2 mm ± 0.5 mm from the face of case, at which point the return force on the latch bolt shall not be less than F_2.

10.2 Resistance to Side Load on Latch Bolt

The lock or latch shall resist a side load F_1 (*see* Fig. 1) as per Table 3 below.

Table 3 Side Load on Latch Bolt Requirements

(*Clause* 10.2)

Grades	F□ (KN)
1	1
2	1.5
3	2

The lock or the latch shall be mounted as shown in given Fig. 4 using metal thread screws of equivalent strength to the fixing means supplied/recommended by the manufacturer.

A force F_1 shall be applied to the securing face of the latch bolt, 3 mm ± 0.2 mm from the case.

Force applied by the tool according to Fig. 5.

The latch action shall not be affected as a result of this test.

The test as given in **10.2** shall be repeated as per the frequency given below:

a) *Grade 1* — Every 12 months;

b) *Grade 2* — Every 6 months; and

c) *Grade 3* — Every 3 months.

NOTE — This repeat test is not applicable for Euro/Oval profile cylinder bodies.

10.3 Torque to Operate Deadbolt

10.3.1 The torque on the key/knob/follower to operate the deadbolt shall not exceed M_2 = 1.5 Nm (*see* Fig. 1).

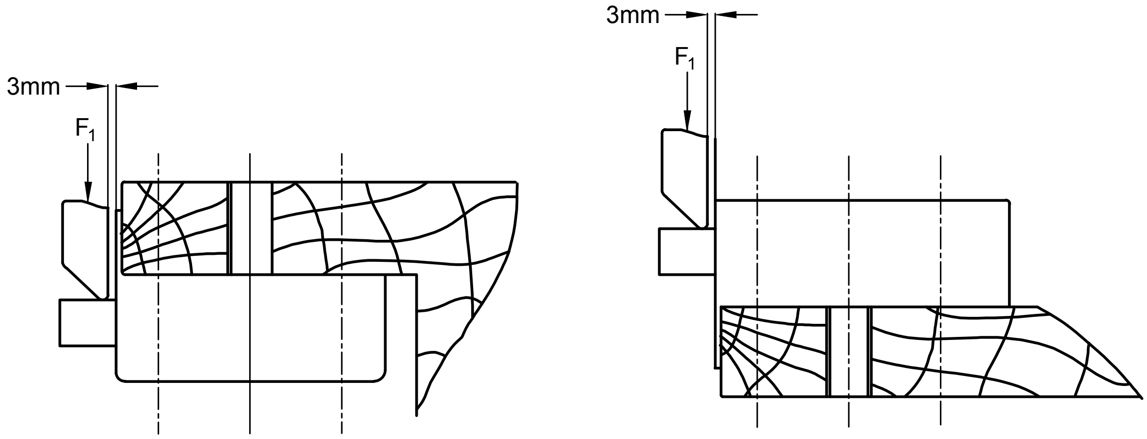
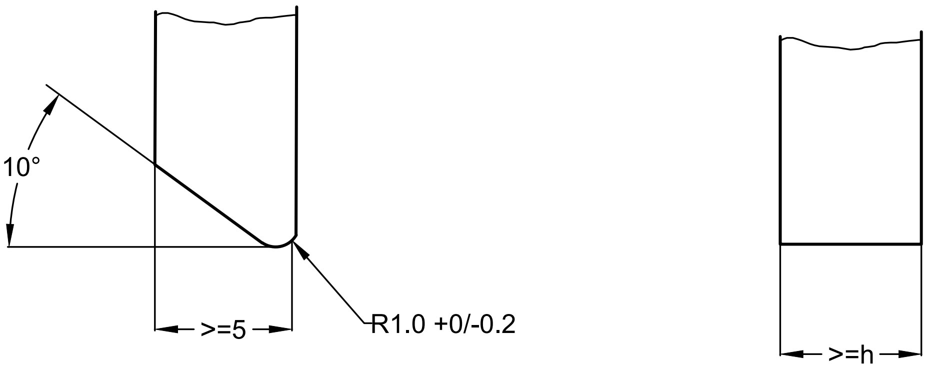


Fig. 4 Testing of Rim Locks and Latches



KEY

h HEIGHT OF DEADBOLT

NOTE - R MENTIONED ABOVE REPRESENTS RADIUS

All dimensions in millimeters

Fig. 5 Shape of Tool

10.3.2 The lock or latch shall be held in a vice or similar fixture in which dead bolt operation should be horizontal to floor.

10.3.3 The suitable torque gauge, a key, cylinder or knob, the deadbolt shall be operated through the full range of movement, during which, the torque shall not exceed 1.5 Nm.

10.4 Torque Resistance of Rim Lock with Lockable Handle/Knob

The lock or latch shall be held in a vice or similar fixture and the torque of M_3 applied, without shock, to the locked knob. Knob shall resist a torque of M_3, where M_3 (Nm) = 0.4 (kN) × maximum radius in mm of the handle/knob after which the lock or latch shall function normally.

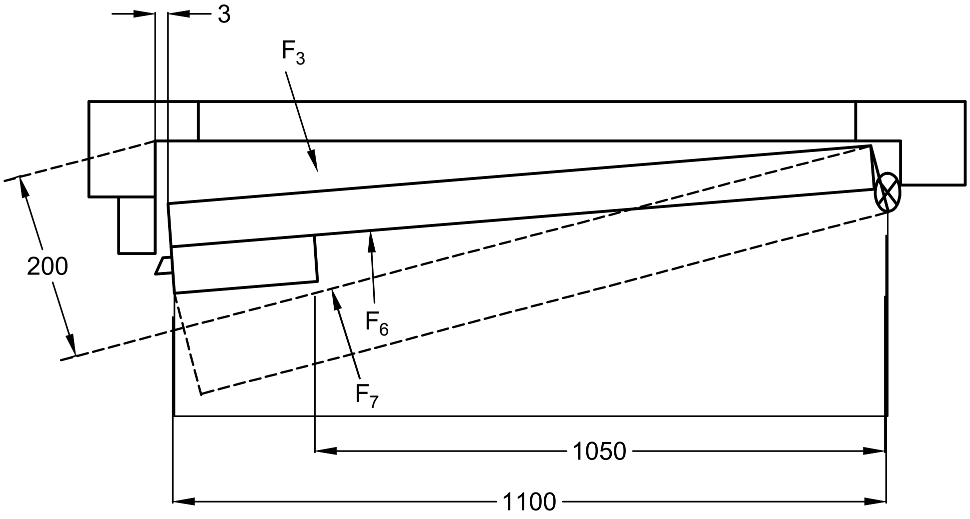
10.5 Durability

10.5.1 *Durability of Latch Action*

10.5.1.1 The latch action shall complete numbers of cycles at the appropriate load as per Table 4.

10.5.1.2 The latch action shall function correctly after this test full filling the requirements of closing force (F_6 = 30 N) and torque (3 Nm) to withdraw the latch bolt.

10.5.1.3 The lock or latch and its correct locking plate shall be mounted on a test door of 100 kg door mass and frame with a gap of 3 mm ±1 mm (*see* Fig. 6). In addition there shall be provision for applying a side load.



All dimensions in millimeters

FIG. 6 DURABILITY OF LATCH ACTION WITH LOAD APPLIED TEST AND CLOSING FORCE TEST

10.5.1.4 Suggest giving/marking distance at which F_3 load is applied (as given below in the classification Table 4.

Table 4 Durability Test Requirements

(*Clause* 10.5.1.1 *and* 10.5.1.4)

Grade	Cycles	Force F_3 (N)
1	100000	10
2	100000	25
3	200000	25

10.5.1.5 Each complete test cycle shall be as follows:

a) apply force F_3, to the test door, in the opening direction;

b) Rotate key/knob to fully withdraw latch bolt with a torque of 3 Nm;

c) Open door a distance of 200 mm ± 5 mm;

d) Allow key/knob to return to 'at rest' position;

e) Remove force F_3; and

f) Allow door to close under influence of force F_7 = 7 N, causing the latch bolt to strike and fully engage in the locking plate. If 7 N is sufficient to close the door and engage the latch bolt in the locking plate, a new F_7 shall than be determined by measuring the force required and increasing the new force F_7 by 20 percent up to a maximum of 50 N for the durability test, causing the latch bolt to strike and fully engage in the locking plate.

Operation speed shall be 10 cycles per minute maximum.

10.5.1.6 The test shall be repeated as per the frequency given below:

a) *Grade 1* — Every 12 months;

b) *Grade 2* — Every 6 months; and

c) *Grade 3* — Every 3 months.

NOTE — This repeat test is not applicable for Euro/Oval profile cylinder bodies.

10.5.2 *Durability of Deadbolt Mechanism*

10.5.2.1 The dead bolt mechanism shall complete 50 000 numbers of cycles.

10.5.2.2 The lock shall be mounted with dead bolt in horizontal position. The test apparatus shall be capable of key rotation, and of inserting and withdrawing the key from the lock. Where it is possible to determine which the outward facing side of the lock is, the key shall be inserted from this side.

10.5.2.3 Each complete test cycle shall be as follows :

a) insert key into lock;

b) Rotate key sufficiently to fully throw and detain deadbolt;

c) Withdraw the key from lock;

d) Re-insert key into lock, and rotate to fully withdraw deadbolt; and

e) Withdraw key from lock.

10.5.2.4 If the withdrawn position, the key may remain in key guide, providing that it is not in contact with the detaining elements (levers, pins, etc.).

10.5.2.5 When the lock is designed to be used in conjunction with a cylinder, the test apparatus shall be required only to fully throw and withdraw the deadbolt, operating the bolt of lock via a simulated cylinder without taking the "cylinder key" in and out.

Operation speed shall be up to 15 cycles per minute. Each cycle should be within 2 s to 4 s.

10.5.2.6 The deadbolt mechanism shall function correctly after this test fulfilling the requirements.

The test shall be repeated as per the frequency given below:

a) *Grade 1* — Every 12 months
b) *Grade 2* — Every 6 months
c) *Grade 3* — Every 3 months

NOTE — This repeat test is not applicable for Euro/Oval profile cylinder bodies.

10.6 Door Mass and Closing Force

10.6.1 *Door Mass*

10.6.1.1 *Test door*

The test door leaf shall be 2 100 mm high and 1 100 mm wide. It shall have means of attaching weights to enable the appropriate door mass to be achieved. The test door and its frame shall have sufficient rigidity such that any distortion perpendicular to the plan of the test door, taking place during the test sequence shall be no more than 5 mm at any position.

10.6.1.2 *Door mass*

Test door mass should be as per Table 5 below.

Table 5 Door Mass Requirements

(*Clause* 10.6.1.2)

Sl No. (1)	Grade (2)	Door Mass (Kg) (3)
i)	1	100
ii)	2	100
iii)	3	120

10.6.2 *Closing Force*

10.6.2.1 A closing force of F_6 = 30 N shall be sufficient to enable the latch bolt to correctly engage the locking plate every time.

10.6.2.2 The lock or latch and its correct locking plate as defined by the manufacturer shall be fitted to a test door and frame as shown in Fig. 6.

10.6.2.3 The latch and the locking plate shall be cleaned before each test.

10.6.2.4 The distance between the lock and the locking plate shall be 3 mm ± 1 mm. The door shall be opened so that the latch bolt is in contact with the locking plate and allowed to close under influence of F_6. The test shall be conducted three times, during which the latch bolt shall correctly engage the locking plate every time.

10.7 Corrosion Resistance and Temperature

10.7.1 *Corrosion Resistance*

10.7.1.1 The torque on key to operate the deadbolt or latch bolt shall not exceed of 1.5 Nm by more than 20 percent.

10.7.1.2 The lock or latch shall be mounted in a fixture similar to a door application and subjected to a neutral salt spray test to determine their ability to operate after environmental exposure; the duration of the test should be as per Table 6.

Table 6 Salt Spray Test Requirements

(*Clause* 10.7.1)

Sl No. (1)	Grade (2)	Time for Salt Spray Test (hours) (3)
i.	1	48
ii.	2	96
iii.	3	96

10.7.1.3 The lock, or latch, shall be operated once every 24 h during the test.

10.7.1.4 Immediately following the neutral salt spray test, and cleaning of the lock, the lock or latch, shall be subjected to the test the return torque of latch bolt. The lock, or latch, shall be operated 20 times. The opening torque shall be measured and recorded during the final three cycles.

NOTE — For the purpose of this standard, the ability to operate after the test is the only criterion; appearance is irrelevant.

10.7.2 *Operation at Extremes of Temperature*

The torque on the key to operate the dead bolt shall not exceed 2 Nm.

The lock shall be stabilized before test by subjecting it to constant temperature of 20+/–5 °C and a relative humidity of 60 percent +/–5 for a period of at least 1 h. The key shall be kept separately at normal room temperature during the test. The lock shall be heated/cooled at the minimum rate of 10 °C +/–10 percent per hour until the required temperature of +80 °C or –20 °C is reached. Test temperature shall be maintained for minimum 2 h and at the end of this time each lock shall be operated as described below:

a) By its correct key/knob to fully throw and withdraw the dead bolt/latch bolt, or
b) Operating torques are to be recorded, in the interval of the last 20 min of the stabilizing time.

10.8 Security

10.8.1 *Resistance to Side Load on Deadbolt*

10.8.1.1 The deadbolt shall resist a side load of $F_4 = 2$ kN (*see* Fig. 1)

10.8.1.2 The lock or latch shall be mounted in a test apparatus as shown in Fig. 4 and a side load F_4 applied by using a tool according to Fig. 5 to the deadbolt at a distance of 3 mm from the case and be held for a period of 60 s + 10/– 0 s.

10.8.1.3 Where the application allows, load shall be applied to the deadbolt from both sides, tested on separate locks.

10.8.1.4 After the test, lock should function.

10.8.2 *Deadbolt Projection*

The deadbolt when fully thrown in the locking direction and detained, shall have a minimum projection, measured from the case of L_1 (*see* Fig. 7) is = 20 mm.

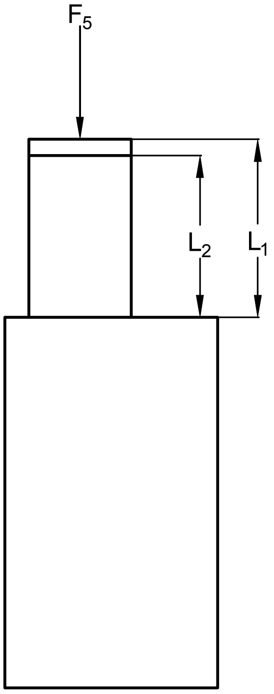


FIG. 7 END LOAD TEST AND DEAD BOLT PROJECTION

Measured perpendicular to the case on the unloaded deadbolt.

10.8.3 *Requirement for End Load on Deadbolt*

The product shall be mounted in a test apparatus, as shown in Fig. 7, in which the projection of deadbolt can be measured. An end load $F_5 = 1$ kN shall be applied to the locked deadbolt for a period of 60 s + 10/– 0 s and the resulting projection be noted.

If the lock is intended for use with a cylinder, a suitable cylinder or dummy cylinder shall be fitted for the test.

10.8.4 *Resistance to End Load*

The product shall resist an end load of $F_5 = 1$kN. At no time during or after the test shall the bolt projection be less than L_2 (*see* Fig. 7) = 17 mm.

Performance criteria A shall apply as mentioned in **12**.

10.8.5 *Resistance to Side Load on Locking Plate*

10.8.5.1 The locking plate shall resist a side load of $F_4 = 3$ KN as shown in Fig. 8.

10.8.5.2 The locking plate shall be mounted in a suitable test apparatus using metal thread screws of equivalent strength to the fixing supplied/recommended by the manufacturer as shown in figure 9 or as defined by the manufacturer, and a side load F_4 applied to the bolt aperture for a period of 60 s +10/– 0 s, using a tool which represent the deadbolt of an appropriate lock or latch.

10.8.5.3 The tests given in **10.8.1**, **10.8.3**, **10.8.4** and **10.8.5** shall be repeated as per the frequency given below:

a) *Grade 1* — Every 12 months;
b) *Grade 2* — Every 6 months; and
c) *Grade 3* — Every 3 months.

NOTE — These repeat tests are not applicable for Euro/Oval profile cylinder bodies.

11 FIELD OF DOOR APPLICATION

11.1 Hinged Door Application

Locks described by manufacturer's instructions for use only on hinged doors.

11.2 Type of Key Operation and Locking

11.2.1 *Dead Locking*

11.2.2 *Manual Locking*

11.2.2.1 One of the following two conditions shall apply either, a) it shall not be possible to remove the key from the lock unless the deadbolt is in its unlocked or fully thrown and deadlocked position. or b) if the key can be removed in an intermediate position, there shall be an indicator or some other special arrangement to indicate the lock is not fully secured.

11.2.2.2 The deadbolt shall be operated from the fully unlocked to fully thrown and deadlocked position with a live end load on the deadbolt of 15 N.

11.2.2.3 Indicators for dead locking the bolt shall be tested, simulating that the deadbolt has not reached its deadlocked position and the key has been removed.

11.2.2.4 The effectiveness of deadlocking shall be determined by an appropriate test.

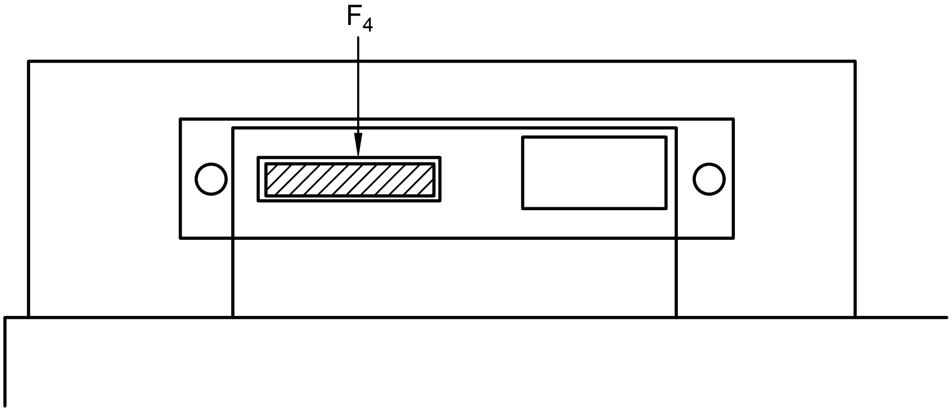


FIG. 8 TYPICAL APPLICATION OF SIDE LOAD F_4 ON DEAD BOLT

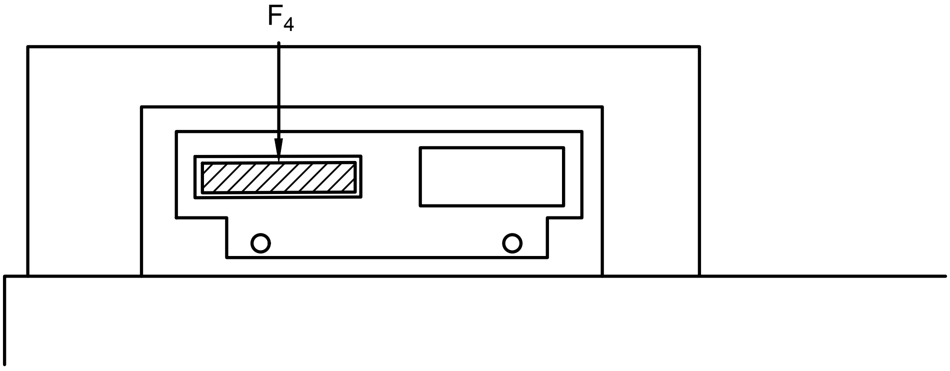


FIG. 9 SIDE LOAD TEST ON LOCKING PLATE

11.2.3 *Manual Locking with intermediate Locking Position*

It shall not be possible to remove the key from the before the bolt is properly deadlocked.

The deadbolt shall be operated from the fully unlocked position to each key removable position with a live end load on the deadbolt of 15 N ensuring that the deadbolt is deadlocked in each position.

11.2.4 *Torque to Withdraw the Latch Bolt with Key*

The torque to withdraw the latch bolt with key shall not exceed M_1 = 1.5 Nm

Using a suitable torque gauge and adapter, the latch bolt shall be withdrawn until the leading edge of the bolt head is flush with the case, during which movement, the torque shall not exceed:

M_1 via key/knob.

11.3 Key Identification Requirements

11.3.1 *Detaining elements*

The minimum number of detaining elements that form part of the deadbolt mechanism (or latch action where there is direct operation by the key) shall be 5.

11.3.2 *Effective Differs*

Locks shall have the minimum number of effective differs as per Grades given in Table 7.

Table 7 Minimum Requirement of Effective Differs

(*Clause* 11.3.2)

Sl No. (1)	Grade (2)	No. of Differs (3)
i)	1	1 000
ii)	2	5 000
iii)	3	20 000

11.3.3 *Non-interchangeability*

The locks shall be manufactured to have non-interchangeability keys in a batch consisting of minimum of 12 locks. In case non-interchangeability in a higher number is required, it shall be so specified by the purchaser at the time of placing the order.

11.3.4 *Non-inter Passing of Key with Just One Interval Differ*

It shall not be possible to open the lock with the next closest key (as defined by the manufacturer’s coding system).

11.3.5 *Coding protection*

Direct coding on the key is not permitted.

11.3.6 *Differing step heights on key*

The differing step heights on keys shall be assessed with reference to the manufacturers differs charts and/or to supporting documentation demonstrating the principle of calculation. It should be minimum 6.

12 GENERAL

12.1 Any model of lock within any one product range having significantly different working components, or working components of significantly different material shall be considered one type and its performance separately tested.

12.1.1 Failure of any one test within a sequence constitutes failure of that particular test sample.

12.1.2 The lock or latch shall be fitted to the test door/apparatus in accordance with the manufacturer's instructions.

NOTE — The scope of any particular product range can be determined by the testing authority in discussion with the manufacturer. This can involve examination of the construction of the various products involved and pretesting of certain attributes in order to determine the most appropriate test sample to represent the product range.

12.1.3 Throughout this Standard, the following tolerances shall apply, unless otherwise stated.

a)	Mass in kilograms or grams (kg or g)	: ± 2 percent
b)	Length in millimeter (mm)	: ± 2 percent
c)	Force in kilo Newton or Newton (kN or N)	: ± 2 percent
d)	Torque in Newton meters (Nm)	: ± 2 percent
e)	Time in seconds (s)	: ± 5 percent
f)	Temperature in degrees Celsius (ºC)	: ± 2 ºC

12.1.4 Unless otherwise stated, force shall be applied and raised to the required level within 60 s ± 10 s and shall be held there for 60 s ± 5 s.

12.1.5 The number of test sample required for testing to this Standard and the test sequences are shown in Annex A.

12.1.6 The following performance criteria shall be used:

12.1.6.1 *Performance criteria – A*

During the application and holding of a force or torque, the product and/or its components shall be allowed to deflect an amount consistent with local tolerances/clearances, but with some plastic deformation taking place, providing that the security function is not significantly compromised, either during or after the test. Additionally, it shall not be possible to manipulate the locked bolt to an unlocked position, during or after the test, using any tool other than the correct key with a maximum torque of 5 Nm. The product does not need to be operable after the test.

NOTE — In case lock fails any higher grade, it can be retested and demoted to lower grade where it passes. The lowest attained Grade of 5 tables (Tables 3 to 7) shall be Grade of lock and min Grade 1 is required to pass the standard requirement. In case of any doubt in testing, please refer EN 12209 : 2003 for reference.

12.2 Test Door

The test door leaf shall be 2 100 mm high and 1 100 mm wide. It shall have means of attaching weight to enable the appropriate door mass to be achieved. The test door and its frame shall have sufficient rigidity such that any distortion perpendicular to the plane of the test door, taking place during the test sequence shall be no more than 5 mm at any position.

NOTE — The components can be cleaned and lubricated without dismantling the lock at the start of the test and after each 5 000 cycles, according to manufacturer's instruction.

13 MARKING

The following information shall be quoted in the labeling, packaging or literature:

a) manufacturer's name or trademark or other means of positive identification;
b) Clear product identification; and
c) number and year of this Standard.

14 PACKING

14.1 Each lock and keys duly wrapped to protect from moisture shall be packed in a card board box.

14.2 Each cardboard box shall be marked with the following information:

a) Manufacturer's name on trade mark;
b) Type of the lock;
c) Size of the lock;
d) Grade of Lock;
    1) *Grade 1* — Low security;
    2) *Grade 2* — Medium security
    3) *Grade 3* — High security
e) Quantity; and
f) Country of origin.

14.3 Each carton may contain 12 or in multiples of 12 locks and no key shall be interchangeable in the box of 12 locks.

14.4 The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the product(s) may be marked with the Standard Mark.

15 EVALUATION OF CONFORMITY

15.1 Initial Type Test

Samples, representative of the series, selected in accordance with Annex A, shall be subjected to the full sequence of tests.

If necessary, (for example, after component changes or redesigns likely to affect the product performance) this initial type test shall be repeated.

ANNEX A

(*Clause* 15.1)

TEST SAMPLING AND SEQUENCING FOR LOCKS AND LATCHES

A-1 VISUAL CHECK ON DOCUMENTATION

a) Door mass;
b) Detaining elements;
c) Effective differs;
d) Differing step heights on key;
e) Non-inter-passing of keys with just one interval differ, Based on manufacturers;
f) Code calculation method; and
g) Coding protection

A-2 TEST SEQUENCE FOR LOCKS, LATCHES AND LOCKING PLATES

A-2.1 Manufacturer and test laboratory shall determine the minimum number of test samples and test sequence needed to verify all applicable requirements.

A-2.2 If there is more than one test performed on each sample, the test sequence shall ensure that previous test do not have influence on following tests in agreed sequence.

A-2.3 All tests excluding visual checks or check on key shall be performed on two samples.

A-2.4 As an example for locks and latches, between six and twelve test samples, depending on type, can be subjected to a sequence of tests. As shown in Table 8.

A-2.5 As an example for locking plates, between two and four test samples, depending on application shall be subjected to a sequence of test in Table 9.

Table 9 Test Sampling and Sequencing for Locking Plates

(*Clause* A-2.5)

Test	Tests for All Locking Plates (Where Applicable)
	Sample A and D
1	Resistance to side load on locking plate

Table 8 Test Sampling and Sequencing for Locks and Latches

(*Clause* A-2.4)

Test	Test for all Locks (Where Applicable)			Locks with Latch Follower (Where Applicable)	Corrosion Requirements
	Sample A and E	Sample B and F	Sample C and G	Sample D and H	Sample I
1	Operation at extremes of temperature		Manual locking	Return force of latch bolt	Corrosion resistance
2	Durability of dead bolt mechanism	Torque to operate dead bolt	Manual locking with intermediate locking position	Torque to with draw the latch bolt with key	
3	No inter passing of keys with just one interval differ	Torque resistance of rim lock with lockable handle/ knob		Torque to with draw latch bolt with handle	
4	Resistance to side load on dead bolt	Torque resistance of knob or lever handle on rim night latch		Closing force	
5			Dead bolt projection		
6				Durability of Latch action with force applied	
7			Resistance to end load		
8				Resistance to side load on latch bolt	

ANNEX B

(*Foreword*)

COMMITTEE COMPOSITION

Utensils, Cutlery Domestic Hardware Sectional Committee, MED 33

Organization	*Representative(s)*
Office of Development Commissioner, Chennai	Shri G. Shanmuganathan (***Chairman***)
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Republic Engineers, Delhi	Shri M. P. Singh

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In Personal Capacity (*179, Sri Sai, 13th Cross, Ananthnagar Phase 1, Electronic City Post*), *Bengaluru*	Shri B. Viswanath Shenoy
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Member Secretary
Shri Chandan Gupta
Scientist 'C' (MED), BIS

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